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ABSTRACT

THE OBJECTIVES OF THIS STUDY WERE: (1) TO DEVELOP A LINEAR PROGRAMING MODEL FOR STATEWIDE PLANNING OF AREA VOCATIONAL-TECHNICAL TRAINING CENTERS, (2) TO DETERMINE THE DISTRICT BOUNDARIES FOR FUTURE CENTERS, (3) TO ESTABLISH BOUNDARIES FOR EXISTING AREA VOCATIONAL-TECHNICAL TRAINING CENTERS, (4) TO MAKE SUCH A CENTER AVAILABLE TO EVERY STUDENT AND ADULT, AND (5) TO DETERMINE THE MINIMUM NUMBER OF CENTERS NEEDED TO SERVE THE STATE ADEQUATELY. RESTRICTIONS IMPOSED WERE RELATED TO THE NUMBER OF STUDENTS, TAX EVALUATION, AND A MAXIMUM RADIUS FROM THE SITE OF THE SCHOOL. FROM 34 LOCATIONS RECOMMENDED, 26 AREA VOCATIONAL-TECHNICAL DISTRICTS WERE PROPOSED. THIS PROCEDURE FOR LOCATING TRAINING CENTERS CAN BE APPLIED TO THE OPTIMUM LOCATION OF ANY SERVICE ORGANIZATION. (JK)

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REPORT OF
RESEARCH IN
VOCATIONAL
TECHNICAL
EDUCATION

STATE-WIDE SYSTEM OF AREA VOCATIONAL-TECHNICAL TRAINING CENTERS FOR OKLAHOMA

by

Charles Oliver Hopkins

RCU

VOCATIONAL
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by

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Oklahoma Vocational
Research Coordinating Unit
Stillwater, Oklahoma
May, 1970

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
OFFICE OF EDUCATION

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CHAPTER I

Introduction

The concept of Area Vocational-Technical Training Centers was introduced in the 1963 Vocational Education Act. This act suggests that training should be provided for all who desire it, need it, and show the initiative to obtain it. The specific provisions in the 1963 Vocational Education Act provide training of: (1) high school students; (2) full-time study for persons who have completed or left high school; (3) persons presently employed, but needing training or retraining to achieve stability or advancement in employment; and (4) persons who have academic, socio-economic or other handicaps that prevent them from succeeding in the regular vocational education program. The 1963 Vocational Education Act was amended by the 1968 Vocational Education Amendments, but did not change the provisions for establishment of Area Vocational-Technical Training Centers by the States [10, 11].

Comprehensive high schools are not likely to be seen in Oklahoma for many years. Small high schools normally offer only one or two vocational courses in their curriculum. Many of these school districts are not financially capable of offering a larger number of vocational courses.

The Area Vocational-Technical Training Center concept is a method derived to provide training in trades and skills at the apprentice

level, where a need exists and employment can be obtained. These centers can be situated so they are within a reasonable commuting distance of all residents in the State of Oklahoma. The theory behind the area school concept is to assist each independent school in offering a greater number of vocational subjects to youth and adults.

Statement of the Problem or Situation

The plan for establishing area vocational-technical training districts is authorized by the Constitutional Amendment as provided in State Question 434.

The location of the first area vocational-technical training centers did not create a problem. After several of these centers were established, other independent districts discovered that they were not a part of surrounding area vocational-technical districts nor possessed the necessary resources to establish an area vocational-technical training district. This created chaos in planning since planners of area vocational-technical training centers desire to make a school available to every high school student and adult in the State of Oklahoma.

The problem is three-fold. First it is necessary to determine area districts. The area districts are limited by certain minimum factors specified by the Department of Vocational-Technical Education and approved by the State Board for Vocational Education. These factors are: (1) The proposed area vocational-technical district should have a total minimum scholastic population of 15,000 or serve approximately a fifty mile radius from the proposed site of the center. (2) The

proposed area vocational-technical district shall have a minimum net assessed evaluation of $40,000,000 after homestead exemptions.

The second problem existing after the district boundaries have been established is to select the location for the school to be built. This location will be in or near a given town or city.

Third, it is desirable to minimize the number of area vocational-technical training centers, yet adequately provide training facilities for the population and stay within the proximity of the restrictions imposed on the study.

Objectives

The objectives of this study are: (1) to develop a linear programming model for state-wide planning of area vocational-technical training centers; (2) to determine the district boundaries for future area vocational-technical training centers; (3) to establish boundaries for existing area vocational-technical training centers; (4) to establish district boundaries so that an area vocational-technical training center is available to every student and adult in the state; and (5) to determine the minimum number of area vocational-technical training centers required to adequately serve the State of Oklahoma.

Significance of Results

This study is restricted to the State of Oklahoma and should facilitate the administering of federal and state funds to area vocational-technical training centers: it is restricted to the State of Oklahoma because every state has different guidelines for establishing area training centers. The model to be developed has the

possibility of being used by any state desiring to locate schools by this method. The study will provide the valuation of each of the vocational-technical training center locations and will provide the State Department of Vocational-Technical Education with some insight pertaining to the amount of funds necessary for establishing a district. Also, the information resulting from this study gives an indication of the number of students enrolled in the eleventh and twelfth grades within the training center boundaries. The State Department of Vocational-Technical Education may desire to use this kind of information to set priorities for establishing area training centers. The purposes of this study are: (1) to serve the State Department of Vocational-Technical Education in attempting to make a school available to each high school student and adult who wishes to attend; (2) to aid in the selection of districts and sites in order to minimize the average miles traveled per student; (3) to provide answers as to the number of schools needed in Oklahoma; and (4) to provide information for the establishment of a state-wide system of area vocational-technical training centers.

The model developed for this study can aid other states in the location of area vocational-technical training centers as well as be used in the future to locate regional junior colleges, intermediate schools, or any other special schools planned.

Review of Literature

The literature pertaining to the existing area vocational-technical training centers in Oklahoma has been reviewed and the information necessary for the establishment of area vocational-technical

training centers will be included and used in this study. The establishment of area vocational-technical training centers requires the districts to vote on forming and then make application for a district. A five member board has to be elected at large. A tax levy is voted by the patrons in the newly formed districts to assure the necessary revenue. The newly formed districts have to show a need for the area vocational-technical training center by providing evidence of employment opportunities to the State Board of Vocational Education [9].

The early vocational-technical training districts were able to meet all the restrictions imposed by the State Department of Vocational-Technical Education and required very little planning for their location. The State Department of Vocational-Technical Education became more selective in approving area vocational-technical training districts and the location of the training center within the approved district as more districts made application and were formed. An area vocational-technical training center should be available to any high school wishing to become a part of an area district with the provision that the necessary procedure is carried out for their joining. This situation has led to the need of state-wide planning of area vocational-technical training centers.

A study was conducted by John Elmo Uxer at New Mexico State University to determine an operational research model for locating area vocational schools. Major characteristics influencing the location and establishment of area vocational schools were determined by a series of personal conferences with state and local educational leaders.

Descriptions of these major characteristics were submitted by Uxer to thirty nationally recognized educational leaders who were asked to rank them in the order of their relative importance.

These ranked factors in order are: (1) number of students by grade level enrolled in public and private schools in the area; (2) total and projected population of the area; (3) industry and business in the area--planned and present; (4) present and predicted state-wide and nation-wide employment opportunities for trainees from vocational and technical education programs; (5) show need (present plus expansion and turnover) in at least five divisions of vocational-technical education; (6) dropout rate of schools in the area; (7) finance resource potential of the area (in addition to that based upon assessed valuation of the area); (8) distance between possible area vocational schools; (9) present tax load in the area; and (10) ability to attract and hold faculty [12].

James Avery Adams of Oklahoma State University conducted a study pertaining to the state-wide planning of intermediate schools. He divided the State of Oklahoma into areas potentially adequate to serve as desirable intermediate units of educational administration. In each respective area special attention was given to the socio-economic factors of total population and pupil population, topography and geography, agricultural regions, economic areas, and trade and service center areas of major trade centers.

Adams mapped off each of these areas and made a single map composed of intermediate districts, following the boundaries established as being best suited to fit all the factors considered [1].

The literature reviewed did not present a plan or model to minimize student miles traveled. No specific system was found to determine the optimum vocational-technical districts boundaries of location of the area school.

Thesis Organization

The remainder of this thesis is divided into three chapters. Chapter II describes the methodology used to determine the optimum location of area vocational-technical training centers. Chapter III will be the presentation and discussion of the recommended area vocational-technical training centers composing the state-wide plan. The final chapter will summarize the previous material presented in the thesis, give the investigator's conclusions, and discuss the need for further research in the area of vocational-technical training centers.

CHAPTER II

Methodology

Many sources were utilized in gathering the information used in the programming technique. A steering committee was organized and meetings were conducted to develop the criteria recommended as standards. The steering committee was composed of the State Director of Vocational-Technical Education, the Supervisory Staff of Area Vocational-Technical Training Centers, the Research Coordinating Unit, and a representative of the Agricultural Education Department at Oklahoma State University. The absence of information relating to the economies of size of area vocational-technical training centers for Oklahoma prompted the steering committee to recommend that the average miles traveled per student be considered the prime factor in locating centers. The optimum locations of area vocational-technical training centers are based on minimizing the average miles traveled per student from the high school locations to the area vocational-technical training center locations.

This chapter is devoted to the development of the linear programming model used to minimize the miles traveled per student. It consists of describing the information necessary for developing the model used for location of area vocational-technical training centers, the right hand sides and their restrictions, and the activities composing the various alternatives programmed and their matrix coefficients.

Linear Programming Model

Linear programming serves as the device to examine all the area vocational-technical training centers and district boundary alternatives. This programming model is a minimizing model [3].

The general minimizing model is:

$$\text{minimize} \qquad c = \sum_{j=1}^{n} c_j x_j$$

$$\text{subject to} \quad \sum_{j=1}^{n} a_{ij} x_j \geq r_i \qquad (i = 1, 2, \ldots, m)$$

$$\text{and} \quad x_j \geq 0 \qquad (j = 1, 2, \ldots, n)$$

The c_j's in the objective function represent a set of given constants (student miles). The r_i represents the requirements composing the right hand side. The choice variables are denoted by x_j and are the level of activity of student transportation. The coefficients of the choice variables are denoted by the a_{ij} and are the matrix coefficients used, such as students, evaluation, etc. There are m constraints and n variables and $n \geq m$.

The average miles traveled by each student will be minimized. The right hand side values are the restrictions of each of the alternatives. Various right hand sides are programmed in order to achieve the minimim miles traveled per student and the minimum number of area vocational-technical training centers recommended to provide a state-wide system of area vocational-technical training centers.

Right Hand Side Development

The guidelines for establishing an area vocational-technical training center presently recommend that the proposed area school district shall have a total minimum scholastic population of 15,000 or serve a 50-mile radius from the proposed site of the school. The steering committee recommended that the 50-mile restriction be replaced with a 35-mile restriction.

Alternative Locations

Key locations were chosen as possible alternatives for locating area vocational-technical training centers and establishing district boundaries. Towns with secondary schools which have an enrollment greater than or equal to three hundred in the top six grades were considered. Some towns were eliminated if they were close to an existing area vocational-technical training center, or on an extreme border of Oklahoma. It was assumed that towns supporting a school enrollment of this size have the capability of providing the services needed by area vocational-technical training centers, such as fire protection, sewage system, and water. A listing of the alternative locations of area vocational-technical training centers is shown in Table I.

District Boundaries

Listing the alternative locations of possible vocational-technical training centers supplies a basis for determining district boundaries. This procedure necessitated tabulating the distance in miles from each independent school within the 35-mile radius to each

TABLE I

ALTERNATIVE AREA VOCATIONAL-TECHNICAL
TRAINING CENTER LOCATIONS

Ada	Fairview	Okmulgee
Altus	Frederick	Owasso
Alva	Ft. Cobb*	Pawnee
Ardmore*	Guthrie	Perry
Atoka	Guymon	Ponca City
Bartlesville*	Henryetta	Poteau*
Blackwell	Hobart	Pryor
Bixby	Holdenville	Sallisaw
Broken Bow	Hominy	Sand Springs
Burns Flat*	Hugo*	Sayre
Chickasha	Idabel	Shawnee*
Claremore	John Marshall (Okla. City)	Stillwater
Cleveland	Kingfisher	Stilwell
Clinton	Laverne	Tahlequah
Coalgate	Lawton*	Tonkawa
Cordell	Mangum	Tulsa (Vo. Tech.)*
Drumright*	McAlester*	Vinita
Duncan*	McLain (Tulsa)	Watonga
Durant	Miami	Wayne*
Edmond	Midwest City	Weatherford
Elk City	Muskogee*	Wilburton
El Reno*	Okemah	Woodward
Enid*	Oklahoma City (Vo. Tech.)*	

*Existing area vocational-technical training centers.

of the alternatives listed in Table I. The mileage was computed from official highway maps of the State of Oklahoma and from Motor Freight Mileage Tariff No. 1-c [7].

The area schools now existing are programmed in order to reestablish their boundaries for a long-run plan. However, the location of existing schools will not change.

Student Population

This study used the enrollment of the eleventh and twelfth grades to determine the population of students available for training. Based on the enrollment of the existing area vocational-technical training centers, it was felt that these two grades would be sufficient to provide the enrollment necessary for the establishment and maintenance of an area vocational-technical training center. Enrollment of schools in Oklahoma was obtained from the State Department of Education Statistical Department and reflects the 1968-69 school year enrollment.

In this study the upper limit for the maximum number of students is 10,000, and the lower limit is zero. These limits are imposed only to facilitate the accounting procedure used in the linear programming model. This program merely accumulates the eleventh and twelfth grade students. A particular maximum and minimum number of students can be obtained by placing the desired restrictions in the right hand sides. The method of accounting was chosen because it allowed the formation of area vocational-technical training centers without the chance of getting an infeasible solution as a result of not meeting the minimum number of students denoted by the restriction.

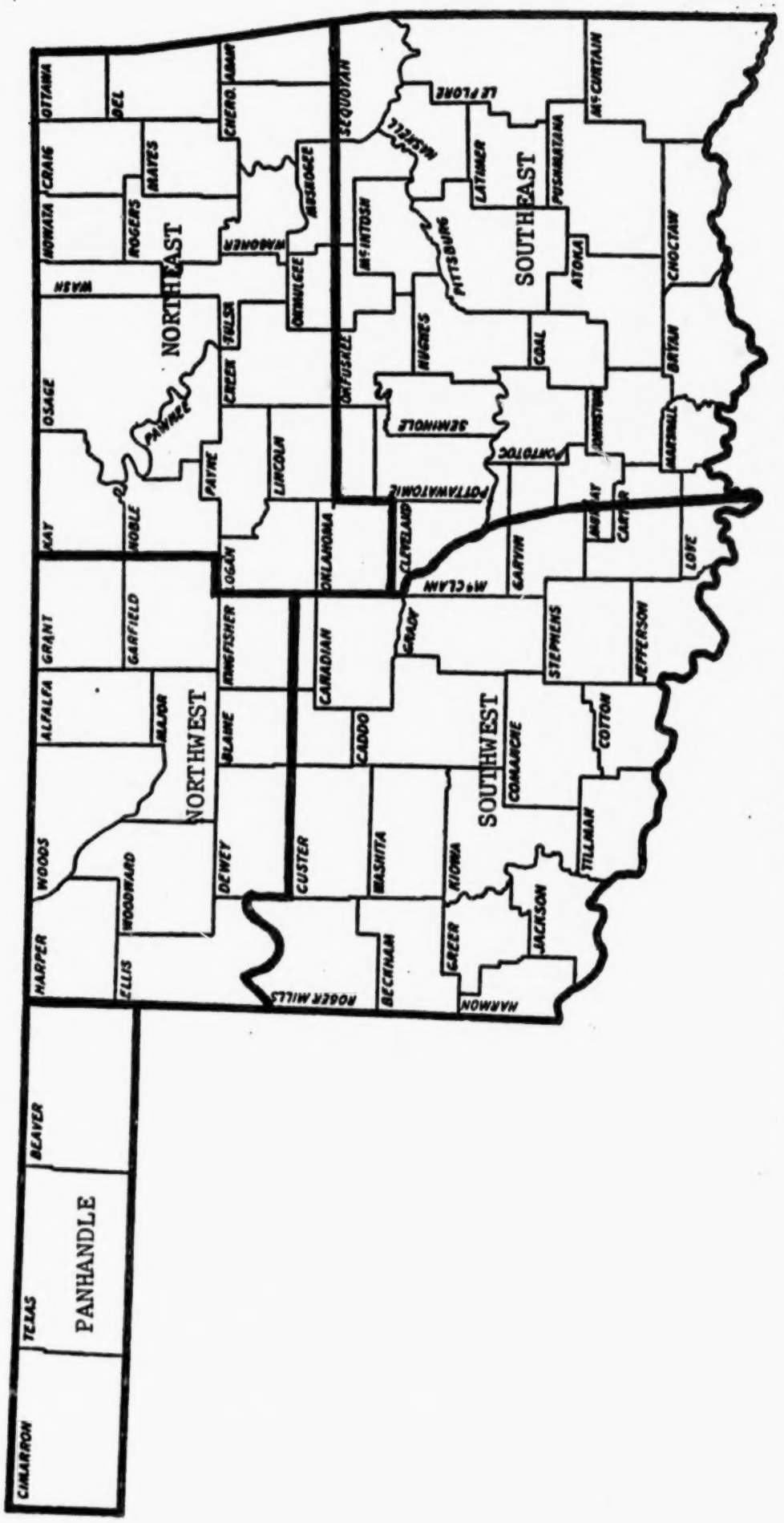

Figure 1. Five Sections of Oklahoma Used in Locating Area Vocational-Technical Training Centers.

Evaluation

The guideline also recommended that a minimum net assessed evaluation of $40,000,000 after homestead exemptions be imposed on area vocational-technical districts. This study adopted the recommendation and used the evaluation of independent school districts. The evaluation of independent school districts for the year of 1969 was acquired from the Oklahoma Tax Commission.

Matrix Development

In order to make the study feasible, the State of Oklahoma was divided into sections as illustrated in Figure 1. The divisions necessitated overlapping the sections so that the independent schools near the intersections could go in either direction. This did not create a problem since the independent schools can be assigned to the area vocational-technical training center that minimizes the miles traveled by their student population.

All the possible combinations of alternatives for their respective section were programmed. These combinations of alternatives appear in the program as different right hand sides. Table II serves as an example of how each of these right hand sides was constructed.

The matrix presented in Table II is a condensed version of the tableau used in considering all the possible combinations of alternative vocational-technical training centers. This represents only a sample of the expanded model used in this study.

The restrictions to be imposed on the combination of area vocational-technical training centers being considered for locations are listed in Column 1 of Table II. It also lists the independent

TABLE II

MODEL OF ACTIVITY MATRIX AND RIGHT HAND SIDE
USED FOR LOCATING AREA VOCATIONAL-
TECHNICAL TRAINING CENTERS

(1)	(2) 1 Student from High School 1 to Vo. Tech. Center 1	(3) 1 Student from High School 1 to Vo. Tech. Center 2	(4) 1 Student from High School 2 to Vo. Tech. Center 1	(5) 1 Student from High School 2 to Vo. Tech. Center 2	(6) 1 Student from High School 3 to Vo. Tech. Center 1	(7) 1 Student from High School 3 to Vo. Tech. Center 2	(8) 1 Student from High School 4 to Vo. Tech. Center 1	(9) 1 Student from High School 4 to Vo. Tech. Center 2	(10)	(11) Right Hand Side
Miles	Miles to Vo. Tech. Center 1	Miles to Vo. Tech. Center 2	Miles to Vo. Tech. Center 1	Miles to Vo. Tech. Center 2	Miles to Vo. Tech. Center 1	Miles to Vo. Tech. Center 2	Miles to Vo. Tech. Center 1	Miles to Vo. Tech. Center 2		
Vo. Tech. Center 1 Max. Students	1		1		1		1		$\leq$	Max. Students for Vo. Tech. Center 1
Vo. Tech. Center 2 Max. Students		1		1		1		1	$\leq$	Max. Students for Vo. Tech. Center 2
Vo. Tech. Center 1 Min. Students	1		1		1		1		$\geq$	Min. Students for Vo. Tech. Center 1
Vo. Tech. Center 2 Min. Students		1		1		1		1	$\geq$	Min. Students for Vo. Tech. Center 2
Vo. Tech. Center 1 Min. Valuation	Val./Stu. High School 1		Val./Stu. High School 2		Val./Stu. High School 3		Val./Stu. High School 4		$\geq$	Min. Valuation for Vo. Tech. Center 1
Vo. Tech. Center 2 Min. Valuation		Val./Stu. High School 1		Val./Stu. High School 2		Val./Stu. High School 3		Val./Stu. High School 4	$\geq$	Min. Valuation for Vo. Tech. Center 2
High School 1 Students	1	1							=	Total Students High School 1
High School 2 Students			1	1					=	Total Students High School 2
High School 3 Students					1	1			=	Total Students High School 3
High School 4 Students							1	1	=	Total Students High School 4

school districts that are considered in the combination composing each of the various right hand sides. Columns 2 through 9 contain the independent school districts being considered, the area vocational-technical training center to which they may be affilitated, the miles from the independent high school to the center, and the matrix coefficients associated with each independent school. The inequality symbols are given in column 10, and are associated with the restrictions appearing in column 11. The maximum number of students in this program was set at 10,000 and the minimum number at zero. The minimum valuation used is $40,000,000. In isolated instances this restriction had to be relaxed in order to obtain a feasible solution. The total eleventh and twelfth grade enrollments composed the total students for each respective high school.

This information was placed in the linear programming model and all the possible combinations of alternatives that appeared feasible were programmed. While the computer was considering one set of alternatives, the restrictions in the other alternative right hand sides were set at zero so that they were not considered. The optimum locations of area vocational-technical training centers for the State of Oklahoma are presented in Chapter III.

CHAPTER III

Optimum State-wide System of Area Vocational-Technical Training Centers

The optimum locations of area vocational-technical training centers were programmed on the assumption that the area centers already established would not be allowed to change locations. The area vocational-technical training centers already established are signified by an asterisk in Tables III, VIII, XXII, and XXXI. The optimum area vocational-technical training centers are presented in this chapter according to the sections in which they were programmed.

Northwest Section

In this section of Oklahoma there were only a few alternatives to consider as possible training center locations. These locations are listed in Table III. There may be other towns in this area large enough to provide the necessary services for an area training center, but they lack the student enrollment to establish a center. Alva, Enid, Fairview, and Woodward are the optimum area vocational-technical training centers for this section of the state. Data on these centers are contained in Tables IV through VII.

These tables provide (1) the area vocational-technical training center location, (2) the valuation of the formed district, (3) the total enrollment of the eleventh and twelfth grade student population

TABLE III

VOCATIONAL-TECHNICAL TRAINING CENTERS
CONSIDERED FOR NORTHWEST SECTION

Alva	Laverne
Enid*	Tonkawa
Fairview	Watonga
Kingfisher	Woodward

*Existing area vocational-technical training center

TABLE IV

ALVA AREA VOCATIONAL-TECHNICAL
TRAINING CENTER LOCATION

VALUATION	$50,460,099
TOTAL NUMBER OF STUDENTS IN 11th & 12th GRADES	581
AVERAGE STUDENT MILES	15.6368

INDEPENDENT SCHOOL DISTRICTS	STUDENTS IN 11th & 12th GRADES	MILES TRAVELED
Waynoka	82	26
Freedom	31	28
Dacoma	38	14
Alva	224	0
Burlington	53	20
Cherokee	92	19
Wakita	61	45

TABLE V

ENID AREA VOCATIONAL-TECHNICAL
TRAINING CENTER LOCATION

VALUATION	$124,865,237
TOTAL NUMBER OF STUDENTS IN 11th & 12th GRADES	2,246
AVERAGE STUDENT MILES	6.9447

INDEPENDENT SCHOOL DISTRICTS	STUDENTS IN 11th & 12th GRADES	MILES TRAVELED
Medford	65	38
Pond Creek	45	21
Enid	1,372	0
Covington	44	24
Garber	80	17
Drummond	33	15
North Enid	47	3
Hunter	28	29
Lahoma	37	10
Pleasant Valley	42	10
Kremlin	60	10
Waukomis	54	7
Marshall	30	32
Dover	41	29
Hennessey	130	19
Carrier	138	14

TABLE VI

FAIRVIEW AREA VOCATIONAL-TECHNICAL
TRAINING CENTER LOCATIONS

VALUATION	$40,305,274
TOTAL NUMBER OF STUDENTS IN 11th & 12th GRADES	647
AVERAGE STUDENT MILES	19.1468

INDEPENDENT SCHOOL DISTRICTS	STUDENTS IN 11th & 12th GRADES	MILES TRAVELED
Seiling	82	31
Ames	32	18
Ringwood	47	19
Fairview	128	0
Cleo Springs	40	9
Jet	50	40
Carmen	38	26
Helena	56	29
Canton	83	18
Okeene	91	21

TABLE VII

WOODWARD AREA VOCATIONAL-TECHNICAL
TRAINING CENTER LOCATION

VALUATION	$75,272,197
TOTAL NUMBER OF STUDENTS IN 11th & 12th GRADES	1,023
AVERAGE STUDENT MILES	19.4349

INDEPENDENT SCHOOL DISTRICTS	STUDENTS IN 11th & 12th GRADES	MILES TRAVELED
Buffalo	94	32
Laverne	108	37
Shattuck	69	31
Gage	20	23
Arnett	50	36
Fargo	28	35
Ft. Supply	35	14
Woodward	351	0
Mooreland	87	10
Mutual	36	21
Vici	41	22
Taloga	53	43
Leedey	51	42

is eligible to attend the area vocational-technical districts, (4) the average miles traveled one way by the students from their respective high school location to the area vocational-technical training center, and (5) the independent school district, their junior and senior enrollment, and the distance from the training center.

The average one way miles traveled per student was derived by calculating the distance from a particular high school location to the area vocational-technical training center and multiplying by the number of eleventh and twelfth grade students enrolled in the high school. The student miles were accumulated and divided by the total number of students.

Certain independent school districts were unable to find an area vocational-technical training center within the 35-mile range used in the programs. Whenever this occurred, these independent districts were assigned to the area vocational-technical training center nearest them.

Northeast Section

This section of Oklahoma represents the most densely populated area. Shown in Table VIII are the various towns considered as possible area vocational-technical training center locations. Additional training centers were also recommended for Tulsa and Oklahoma City. Combinations of these alternatives were programmed and Bartlesville, Drumright, John Marshall (Oklahoma City), McLain (Tulsa), Miami, Midwest City, Muskogee, Oklahoma City Area Vocational-Technical Center, Pawnee, Ponca City, Pryor, Stilwell, and Tulsa Area Vocational-Technical Center are the thirteen sites that compose the optimum location of area vocational-technical training centers and are illustrated in Tables IX through XXI.

TABLE VIII

VOCATIONAL-TECHNICAL TRAINING CENTERS
CONSIDERED FOR NORTHEAST SECTION

Bartlesville*	Oklahoma City Vo. Tech*
Blackwell	Okmulgee
Bixby	Owasso
Claremore	Pawnee
Cleveland	Perry
Drumright*	Ponca City
Edmond	Pryor
Guthrie	Sallisaw
Hominy	Sand Springs
John Marshall (Okla. City)	Stillwater
McLain	Stilwell
Miami	Tahlequah
Midwest City	Tulsa Vo. Tech.*
Muskogee*	Vinita
Okemah	

*Existing area vocational-technical training centers

TABLE IX

BARTLESVILLE AREA VOCATIONAL-TECHNICAL
TRAINING CENTER LOCATION

VALUATION	$87,398,599
TOTAL NUMBER OF STUDENTS IN 11th & 12th GRADES	2,425
AVERAGE STUDENT MILES	8.8746

INDEPENDENT SCHOOL DISTRICTS	STUDENTS IN 11th & 12th GRADES	MILES TRAVELED
Wynona	34	35
Pawhuska	209	25
Copan	54	12
Dewey	227	5
Ochelata	38	16
Barnsdall	108	20
Ramona	71	18
Bartlesville	1,334	0
Lenapah	73	32
Nowata	150	21
Wann	26	23
Delaware	38	26
Alluwe	63	35

TABLE X

DRUMRIGHT AREA VOCATIONAL-TECHNICAL
TRAINING CENTER LOCATION

VALUATION	$45,560,834
TOTAL NUMBER OF STUDENTS IN 11th & 12th GRADES	1,581
AVERAGE STUDENT MILES	17.9462

INDEPENDENT SCHOOL DISTRICTS	STUDENTS IN 11th & 12th GRADES	MILES TRAVELED
Davenport	73	24
Stroud	136	17
Agra	31	21
Carney	41	34
Ripley	48	18
Yale	91	16
Cushing	283	9
Perkins	100	28
Drumright	168	0
Oilton	69	16
Depew	57	26
New Mannford	94	22
Olive	48	9
Kelleyville	72	28
Bristow	200	25
Slick	25	35
Coyle	45	36

TABLE XI

JOHN MARSHALL AREA VOCATIONAL-TECHNICAL
TRAINING CENTER LOCATION

VALUATION	$339,408,525
TOTAL NUMBER OF STUDENTS IN 11th & 12th GRADES	7,494
AVERAGE STUDENT MILES	7.2680

INDEPENDENT SCHOOL DISTRICTS	STUDENTS IN 11th & 12th GRADES	MILES TRAVELED
Edmond	580	8
Bethany	137	8
Deer Creek	36	15
Putnam	2,040	7
Classen*	621	5
Northwest Classen*	1,453	6
Northeast High*	565	6
Cashion	37	25
Luther	52	20
John Marshall*	1,398	0
Guthrie	442	27
Cresent	85	35
Mulhall	48	38

*These schools are a part of the Oklahoma City School System and are not independent school districts.

TABLE XII

MCLAIN AREA VOCATIONAL-TECHNICAL
TRAINING CENTER LOCATION

VALUATION	$231,416,353
TOTAL NUMBER OF STUDENTS IN 11th & 12th GRADES	4,732
AVERAGE STUDENT MILES	6.0775

INDEPENDENT SCHOOL DISTRICTS	STUDENTS IN 11th & 12th GRADES	MILES TRAVELED
New Prue	26	15
Collinsville	170	20
Skiatook	145	13
Owasso	244	12
Sperry	106	8
Sand Springs	726	10
Washington*	651	3
McLain*	960	0
Central*	1,641	5
Oolagah	63	30

*These schools are a part of the Tulsa School System and are not independent school districts.

TABLE XIII

MIAMI AREA VOCATIONAL-TECHNICAL
TRAINING CENTER LOCATION

VALUATION	$42,881,870
TOTAL NUMBER OF STUDENTS IN 11th & 12th GRADES	1,454
AVERAGE STUDENT MILES	12.6435

INDEPENDENT SCHOOL DISTRICTS	STUDENTS IN 11th & 12th GRADES	MILES TRAVELED
Bluejacket	49	23
Grove	125	27
Jay	188	39
Wyandotte	83	15
Quapaw	77	10
Commerce	100	5
Fairland	57	18
Afton	74	15
Pitcher-Cardin	94	10
Welch	65	13
Miami	542	0

TABLE XIV

MIDWEST CITY AREA VOCATIONAL-TECHNICAL
TRAINING CENTER LOCATION

VALUATION	$102,948,536
TOTAL NUMBER OF STUDENTS IN 11th & 12th GRADES	3,772
AVERAGE STUDENT MILES	2.5755

INDEPENDENT SCHOOL DISTRICTS	STUDENTS IN 11th & 12th GRADES	MILES TRAVELED
Spencer*	469	5
Dungee*	164	9
Harrah	116	13
Choctaw	474	7
Jones	89	12
Midwest City	2,460	0

*These schools are a part of Oklahoma City School System and are not independent school districts.

TABLE XV

MUSKOGEE AREA VOCATIONAL-TECHNICAL
TRAINING CENTER LOCATION

VALUATION	$80,064,558
TOTAL NUMBER OF STUDENTS IN 11th & 12th GRADES	3,046
AVERAGE STUDENT MILES	12.1687

INDEPENDENT SCHOOL DISTRICTS	STUDENTS IN 11th & 12th GRADES	MILES TRAVELED
Webbers Falls	68	34
Ft. Gibson	119	6
Braggs	32	20
Warner	77	22
Muskogee	1,442	0
Boynton	40	22
Taft-Moton	50	12
Porum	75	32
Oktaha	59	19
Haskell	123	24
Gore	55	33
Vian	111	38
Hulbert	89	20
Wagoner	231	20
Porter	53	14
Okay	59	6
Coweta	141	30
Checotah	222	27

TABLE XVI

OKLAHOMA CITY AREA VOCATIONAL-TECHNICAL
TRAINING CENTER LOCATION

VALUATION	$287,117,731
TOTAL NUMBER OF STUDENTS IN 11th & 12th GRADES	6,858
AVERAGE STUDENT MILES	6.3288

INDEPENDENT SCHOOL DISTRICTS	STUDENTS IN 11th & 12th GRADES	MILES TRAVELED
Crooked Oak	326	3
Douglas*	904	5
Capitol Hill*	1,218	4
Southeast*	718	3
Grant*	1,417	5
Western Heights	250	11
Norman	1,211	12
Moore	814	8

*These schools are a part of the Oklahoma City School System and are not independent school districts.

TABLE XVII

PAWNEE AREA VOCATIONAL-TECHNICAL TRAINING CENTER LOCATION

VALUATION	$53,058,978
TOTAL NUMBER OF STUDENTS IN 11th & 12th GRADES	1,445
AVERAGE STUDENT MILES	23.6795

INDEPENDENT SCHOOL DISTRICTS	STUDENTS IN 11th & 12th GRADES	MILES TRAVELED
Hominy	138	31
Glencoe	33	13
Stillwater	611	30
Pawnee	133	0
Cleveland	148	21
Ralston	48	16
Perry	203	24
Fairfax	86	22
Morrison	45	12

TABLE XVIII

PONCA CITY AREA VOCATIONAL-TECHNICAL
TRAINING CENTER LOCATION

VALUATION	$95,192,401
TOTAL NUMBER OF STUDENTS IN 11th & 12th GRADES	2,050
AVERAGE STUDENT MILES	21.0007

INDEPENDENT SCHOOL DISTRICTS	STUDENTS IN 11th & 12th GRADES	MILES TRAVELED
Lamont	38	28
Deer Creek	19	35
Billings	35	27
Marland	28	14
Ponca City	1,097	0
Blackwell	377	20
Braman	34	28
Red Rock	33	25
Newkirk	135	14
Shidler	116	29
Tonkawa	138	12

TABLE XIX

PRYOR AREA VOCATIONAL-TECHNICAL
TRAINING CENTER LOCATION

VALUATION	$43,887,167
TOTAL NUMBER OF STUDENTS IN 11th & 12th GRADES	1,789
AVERAGE STUDENT MILES	15.9508

INDEPENDENT SCHOOL DISTRICTS	STUDENTS IN 11th & 12th GRADES	MILES TRAVELED
Strang	32	16
Salina	87	10
Ketchum	40	28
Pryor	348	0
Choteau	81	9
Locust Grove	174	17
Adair	74	9
Vinita	197	27
White Oak	40	26
Big Cabin	31	17
Oaks Mission	70	37
Inola	83	21
Claremore	342	17
Chelsea	102	25
Sequoyah	61	22
Foyil	27	28

TABLE XX

STILWELL AREA VOCATIONAL-TECHNICAL
TRAINING CENTER LOCATION

VALUATION	$17,415,138
TOTAL NUMBER OF STUDENTS IN 11th & 12th GRADES	1,728
AVERAGE STUDENT MILES	24.0572

INDEPENDENT SCHOOL DISTRICTS	STUDENTS IN 11th & 12th GRADES	MILES TRAVELED
Sallisaw	253	28
Muldrow	153	39
Gans	35	36
Roland	91	43
Central High	32	29
Tahlequah	475	24
Kansas	96	40
Colcord	87	41
Stilwell	272	0
Westville	128	14
Watts	42	22
Cave Springs	64	14

TABLE XXI

TULSA AREA VOCATIONAL-TECHNICAL
TRAINING CENTER LOCATION

VALUATION	$460,112,700
TOTAL NUMBER OF STUDENTS IN 11th & 12th GRADES	9,023
AVERAGE STUDENT MILES	6.5381

INDEPENDENT SCHOOL DISTRICTS	STUDENTS IN 11th & 12th GRADES	MILES TRAVELED
Mounds	49	29
Glenpool	39	15
Bixby	174	12
Broken Arrow	551	4
East Central*	783	5
Will Rogers*	1,635	6
Hale*	1,469	3
Edison*	1,200	4
Memorial*	1,335	3
Webster*	631	8
Berryhill	124	13
Union	93	5
Liberty	36	18
Kiefer	45	26
Jenks	206	10
Catoosa	188	12
Sapulpa	665	20

*These schools are a part of the Tulsa School System and are not independent school districts.

Whenever possible the existing area vocational-technical training centers were expanded. Stilwell area vocational-technical training center, Table XX, is actually an addition to the program in the form of locating a satellite training center for the Muskogee Area Vocational-Technical Training Center. It may be noted that the satellite training center would provide a total junior and senior enrollment of 1,728 students. However, the accumulated valuation of the independent districts composing this location is only $17,415,138. Attaching to the Muskogee center will allow many students to receive training who otherwise will not have the opportunity because the valuation will not allow the establishment of an area vocational-technical training center.

The valuation for the area vocational-technical training centers located in Oklahoma City and Tulsa was derived by the following procedure: (1) The total valuation was obtained for each of the two school systems. (2) The total eleventh and twelfth grade enrollment was secured for each high school within the two school systems. (3) The total eleventh and twelfth grade enrollment was divided into the total valuation for each of the two school systems to determine the per pupil valuation used in the programming model.

Southeast Section

The extreme southeast section of the state presents problems in both the mileage and valuation restrictions. A satellite combination already exists in this portion of the state. In addition to McAlester, Hugo, and Poteau, one other school would need to be considered in order to complete the satellite combination and make a school available to

high school students and adults within a reasonable distance. Table XXII contains the various possible locations of area vocational-technical training centers for the southeast section.

Ada, Broken Bow, Durant, Henryetta, Hugo, McAlester, Poteau, and Shawnee are the sites selected for this area of the state. Tables XXIII through XXX contain the optimum locations of area vocational-technical training centers for this section.

The valuation restriction was relaxed to find the optimum location of satellite training centers for the extreme southeast portion of Oklahoma. Broken Bow, Table XXIV; Hugo, Table XXVII; McAlester, Table XXVIII; and Poteau, Table XXIX; are recommended as one area vocational-technical training district. This combination of satellite training centers will accumulate a total valuation in excess of the $40,000,000 minimum necessary for the establishment of a vocational-technical training district. Other area vocational-technical training centers in this section were able to meet the minimum restrictions imposed on establishment of area vocational-technical districts.

Southwest Section

Southwestern Oklahoma already has several area vocational-technical districts established. Table XXXI is a list of the existing and alternative locations considered in this section.

The optimum training center locations are Altus, Ardmore, Burns Flat, Duncan, Fort Cobb, El Reno, Lawton, and Wayne. Data on these centers are presented in Tables XXXII through XXXIX.

The information contained in these tables should provide insight for independent school districts wishing to become part of an area

TABLE XXII

VOCATIONAL-TECHNICAL TRAINING CENTERS
CONSIDERED FOR SOUTHEAST SECTION

Ada	Hugo*
Atoka	Idabel
Broken Bow	McAlester*
Coalgate	Poteau*
Durant	Shawnee*
Henryetta	Wilburton
Holdenville	

*Existing area vocational-technical centers

TABLE XXIII

ADA AREA VOCATIONAL-TECHNICAL
TRAINING CENTER LOCATION

VALUATION	$52,427,552
TOTAL NUMBER OF STUDENTS IN 11th & 12th GRADES	1,726
AVERAGE STUDENT MILES	16.8615

INDEPENDENT SCHOOL DISTRICTS	STUDENTS IN 11th & 12th GRADES	MILES TRAVELED
Mill Creek	35	31
Olney	37	32
Tupelo	59	20
Roff	29	15
Allen	63	18
Vanoss	81	13
McLish	45	12
Latta	87	1
Stonewall	76	13
Stratford	66	16
Calvin	50	30
Konawa	85	16
Sasakawa	46	21
Bowlegs	63	31
Asher	59	22
Wanette	39	30
Coalgate	91	34
Byng	160	8
Ada	340	0
Holdenville	215	36

TABLE XXIV

BROKEN BOW AREA VOCATIONAL-TECHNICAL TRAINING CENTER LOCATION

VALUATION	$13,275,406
TOTAL NUMBER OF STUDENTS IN 11th & 12th GRADES	890
AVERAGE STUDENT MILES	14.2269

INDEPENDENT SCHOOL DISTRICTS	STUDENTS IN 11th & 12th GRADES	MILES TRAVELED
Wright City	57	25
Haworth	120	19
Eagletown	44	10
Battiest	67	33
Smithville	62	39
Broken Bow	216	0
Idabel	324	12

TABLE XXV

DURANT AREA VOCATIONAL-TECHNICAL
TRAINING CENTER LOCATION

VALUATION	$40,000,000
TOTAL NUMBER OF STUDENTS IN 11th & 12th GRADES	1,341
AVERAGE STUDENT MILES	15.5727

INDEPENDENT SCHOOL DISTRICTS	STUDENTS IN 11th & 12th GRADES	MILES TRAVELED
Kingston	59	20
Cobb	54	8
Caddo	45	11
Colera	46	5
Blue	57	9
Achille	53	12
Colbert	71	13
Yuba	33	24
Bokchito	49	13
Bennington	56	20
Milburn	35	23
Coleman	31	20
Wapanucka	39	28
Tushka	40	26
Caney	56	18
Boswell	62	30
Durant	305	0
Atoka	250	30

TABLE XXVI

HENRYETTA AREA VOCATIONAL-TECHNICAL
TRAINING CENTER LOCATION

VALUATION	$46,712,742
TOTAL NUMBER OF STUDENTS IN 11th & 12th GRADES	1,802
AVERAGE STUDENT MILES	14.7635

INDEPENDENT SCHOOL DISTRICTS	STUDENTS IN 11th & 12th GRADES	MILES TRAVELED
Okemah	118	20
Weleetka	90	17
Bearden	37	30
Boley	88	30
Schulter	33	5
Beggs	105	22
Preston	62	18
Dewar	81	4
Henryetta	262	0
Okmulgee	521	12
Morris	101	18
Hanna	32	20
Dustin	36	13
Wetumka	73	27
Moss	34	40
Mason	33	29
Graham	37	13
Wilson	24	8
Midway	35	26

TABLE XXVII

HUGO AREA VOCATIONAL-TECHNICAL TRAINING CENTER LOCATION

VALUATION	$12,861,513
TOTAL NUMBER OF STUDENTS IN 11th & 12th GRADES	728
AVERAGE STUDENT MILES	11.8296

INDEPENDENT SCHOOL DISTRICTS	STUDENTS IN 11th & 12th GRADES	MILES TRAVELED
Hugo	228	0
Ratton	44	20
Antlers	143	20
Soper	41	12
Towson	93	15
Grant	69	5
Valliant	110	24

TABLE XXVIII

MCALESTER AREA VOCATIONAL-TECHNICAL
TRAINING CENTER LOCATION

VALUATION	$36,770,230
TOTAL NUMBER OF STUDENTS IN 11th & 12th GRADES	1,798
AVERAGE STUDENT MILES	16.0172

INDEPENDENT SCHOOL DISTRICTS	STUDENTS IN 11th & 12th GRADES	MILES TRAVELED
Buffalo Valley	50	30
Kinta	37	38
Hartshorne	170	17
Quinton	68	30
Haileyville	78	14
Haywood	19	11
Kiowa	60	17
Canadian	33	21
Indianola	43	18
Crowder	35	15
Savanna	66	9
Pittsburg	35	19
Wilburton	116	33
McAlester	649	0
Stuart	38	20
Stringtown	47	34
Eufaula	163	28
Clayton	91	51

TABLE XXIX

POTEAU AREA VOCATIONAL-TECHNICAL
TRAINING CENTER LOCATION

VALUATION	$25,684,369
TOTAL NUMBER OF STUDENTS IN 11th & 12th GRADES	1,462
AVERAGE STUDENT MILES	20.4699

INDEPENDENT SCHOOL DISTRICTS	STUDENTS IN 11th & 12th GRADES	MILES TRAVELED
Red Oak	50	30
Panola	26	3[illegible]
Keota	74	30
McCurtain	[illegible]	27
Talahina	[illegible]9	39
Wister	68	9
LeFlore	48	29
Howe	45	8
Cameron	43	9
Spiro	227	15
Heavener	120	13
Pacola	68	20
Panama	86	9
Bokoshe	47	18
Poteau	185	0
Whitesboro	50	50
Stigler	192	38

TABLE XXX

SHAWNEE AREA VOCATIONAL-TECHNICAL
TRAINING CENTER LOCATION

VALUATION	$48,974,195
TOTAL NUMBER OF STUDENTS IN 11th & 12th GRADES	2,453
AVERAGE STUDENT MILES	13.6379

INDEPENDENT SCHOOL DISTRICTS	STUDENTS IN 11th & 12th GRADES	MILES TRAVELED
New Lima	61	20
Butner	70	30
Pleasant Grove	34	16
Varnum	42	15
Strothers	31	20
Maud	66	23
McLoud	83	12
Dale	63	10
Earlsboro	42	12
Bethel	84	6
Macomb	33	18
Tecumseh	174	7
Paden	59	31
Meeker	93	12
Prague	93	24
Wellston	69	31
Chandler	126	23
Wewoka	220	33
Shawnee	752	0
Seminole	258	19

TABLE XXXI

VOCATIONAL-TECHNICAL TRAINING CENTERS
CONSIDERED FOR SOUTHWEST SECTION

Altus	Frederick
Ardmore*	Ft. Cobb*
Burns Flat*	Hobart
Chickasha	Lawton*
Clinton	Mangum
Cordell	Sayre
Duncan*	Wayne*
Elk City	Weatherford
El Reno*	

*Existing area vocational-technical centers

TABLE XXXII

ALTUS AREA VOCATIONAL-TECHNICAL
TRAINING CENTER LOCATION

VALUATION	$67,815,861
TOTAL NUMBER OF STUDENTS IN 11th & 12th GRADES	1,601
AVERAGE STUDENT MILES	17.5103

INDEPENDENT SCHOOL DISTRICTS	STUDENTS IN 11th & 12th GRADES	MILES TRAVELED
Granite	64	25
Blair	61	10
Lone Wolf	32	26
Mangum	144	25
Duke	25	14
Roosevelt	32	33
Altus	550	0
Eldorado	24	26
Hollis	96	34
Snyder	63	22
Gould	40	26
Arnett	24	44
Navajo	35	14
Olustee	33	12
Southside	28	11
Mt. Park	31	25
Tipton	67	21
Davidson	35	47
Frederick	217	35

TABLE XXXIII

ARDMORE AREA VOCATIONAL-TECHNICAL
TRAINING CENTER LOCATION

VALUATION	$61,777,315
TOTAL NUMBER OF STUDENTS IN 11th & 12th GRADES	2,156
AVERAGE STUDENT MILES	16.0756

INDEPENDENT SCHOOL DISTRICTS	STUDENTS IN 11th & 12th GRADES	MILES TRAVELED
Fox	120	31
Graham	28	28
Davis	118	24
Healdton	110	24
Marietta	99	17
Ringling	85	26
Sulphur	176	33
Tishomingo	126	31
Dickson	136	10
Lone Grove	52	7
Springer	38	9
Wilson	83	17
Plainview	80	8
Thatcherville	38	27
Madill	155	23
Turner	74	32
Ardmore	638	0

TABLE XXXIV

BURNS FLAT AREA VOCATIONAL-TECHNICAL
TRAINING CENTER LOCATION

VALUATION	$89,320,082
TOTAL NUMBER OF STUDENTS IN 11th & 12th GRADES	1,986
AVERAGE STUDENT MILES	25.9566

INDEPENDENT SCHOOL DISTRICTS	STUDENTS IN 11th & 12 GRADES	MILES TRAVELED
Arapaho	32	30
Carter	35	28
Cheyenne	50	48
Clinton	310	21
Cordell	131	14
Erick	58	46
Hammon	51	33
Sayre	143	31
Sentinel	82	13
Sweetwater	27	50
Hobart	166	31
Weatherford	164	35
Canute	56	13
Butler	33	21
Dill City	42	7
Burns Flat	109	0
Elk City	248	21
Reydon	38	64
Merritt	32	28
Thomas	83	37
Custer City	49	37
Washita Heights	47	35

TABLE XXXV

DUNCAN AREA VOCATIONAL-TECHNICAL
TRAINING CENTER LOCATION

VALUATION	$53,015,667
TOTAL NUMBER OF STUDENTS IN 11th & 12th GRADES	1,738
AVERAGE STUDENT MILES	10.2767

INDEPENDENT SCHOOL DISTRICTS	STUDENTS IN 11th & 12th GRADES	MILES TRAVELED
Temple	90	30
Rush Springs	77	19
Duncan	791	0
Marlow	153	10
Bray	49	19
Comanche	173	8
Waurika	84	23
Velma-Alma	105	18
Empire	52	25
Central	39	10
Ninnekah	54	32
Ryan	41	33
Terral	30	42

TABLE XXXVI

FT. COBB AREA VOCATIONAL-TECHNICAL
TRAINING CENTER LOCATION

VALUATION	$43,994,488
TOTAL NUMBER OF STUDENTS IN 11th & 12th GRADES	1,434
AVERAGE STUDENT MILES	20.6938

INDEPENDENT SCHOOL DISTRICTS	STUDENTS IN 11th & 12th GRADES	MILES TRAVELED
Carnegie	138	12
Mt. View	75	19
Eakly	45	24
Gotebo	32	27
Binger	64	19
Oney	33	11
Lookeba-Sickles	64	19
Anadarko	272	15
Broxton	33	14
Gracemont	37	23
Verden	40	24
Chickasha	426	32
Ft. Cobb	65	0
Apache	110	17

TABLE XXXVII

EL RENO AREA VOCATIONAL-TECHNICAL
TRAINING CENTER LOCATION

VALUATION	$88,397,497
TOTAL NUMBER OF STUDENTS IN 11th & 12th GRADES	1,644
AVERAGE STUDENT MILES	17.8229

INDEPENDENT SCHOOL DISTRICTS	STUDENTS IN 11th & 12th GRADES	MILES TRAVELED
Geary	48	25
Hydro	42	36
Hinton	66	27
Greenfield	21	33
Calumet	50	14
Okarche	80	14
Kingfisher	172	24
Piedmont	33	23
Yukon	129	12
Union City	27	10
Mustang	108	21
Minco	80	15
Tuttle	86	23
Amber	61	33
El Reno	445	0
Lomega	34	39
Watonga	162	42

TABLE XXXVIII

LAWTON AREA VOCATIONAL-TECHNICAL
TRAINING CENTER LOCATION

VALUATION	$76,481,351
TOTAL NUMBER OF STUDENTS IN 11th & 12th GRADES	2,723
AVERAGE STUDENT MILES	6.1289

INDEPENDENT SCHOOL DISTRICTS	STUDENTS IN 11th & 12th GRADES	MILES TRAVELED
Lawton	1,990	0
Cyril	57	27
Cement	50	31
Cache	75	13
Indiahoma	29	20
Sterling	56	21
Geronimo	34	7
Fletcher	52	23
Elgin	103	18
Chattanooga	52	23
Walters	117	22
Big Pasture	37	32
Grandfield	71	37

TABLE XXXIX

WAYNE AREA VOCATIONAL-TECHNICAL
TRAINING CENTER LOCATION

VALUATION	$53,037,428
TOTAL NUMBER OF STUDENTS IN 11th & 12th GRADES	1,662
AVERAGE STUDENT MILES	18.3814

INDEPENDENT SCHOOL DISTRICTS	STUDENTS IN 11th & 12th GRADES	MILES TRAVELED
Wynnewood	145	23
Elmore City	75	27
Pauls Valley	276	14
Paoli	38	7
Maysville	97	13
Newcastle	58	33
Pernell	36	35
Dibble	57	22
Washington	49	12
Purcell	136	8
Blanchard	73	29
Lindsay	252	25
Alex	53	36
Lexington	81	9
Noble	139	19
Wayne	97	0

vocational-technical training district. With the exception of isolated independent school districts, all the restrictions imposed on locating a center were met by the area vocational-technical training centers composing the optimum solutions for this area of the state.

Panhandle Section

In discussing the formation of area vocational-technical training centers for the Panhandle section of the state the steering committee recommended that one training center be established. This center is located at Guymon and presented in Table XL. The sparse population of this area makes it difficult to establish a training center within the limits of the restrictions imposed on the program. The 35-mile range was extended to a 50-mile range in locating an area vocational-technical training center for this section. Even with this extended mileage five independent school districts were unable to become a part of a vocational-technical training center in the listing of the optimum locations. These isolated districts do have access to area vocational-technical training centers, but will have to travel farther than 50 miles to reach a center. This section is so thinly populated that it is not feasible to establish a satellite training center.

Summary of Optimum Locations

In some of the tables presented in this chapter certain independent districts may be found that are closer to another vocational-technical training center but are not listed under that location. This occurred in order to satisfy the $40,000,000 minimum valuation placed on the formation of an area vocational-technical district. Figure 2 is a

TABLE XL

GUYMON AREA VOCATIONAL-TECHNICAL
TRAINING CENTER LOCATION

VALUATION	$57,363,549
TOTAL NUMBER OF STUDENTS IN 11th & 12th GRADES	739
AVERAGE STUDENT MILES	17.2584

INDEPENDENT SCHOOL DISTRICTS	STUDENTS IN 11th & 12th GRADES	MILES TRAVELED
Keyes	58	50
Balko	43	46
Turpin	38	45
Guymon	316	0
Hardesty	22	18
Hooker	105	20
Tyrone	35	30
Goodwell	9	10
Yarbrough	27	30
Texhoma	86	20

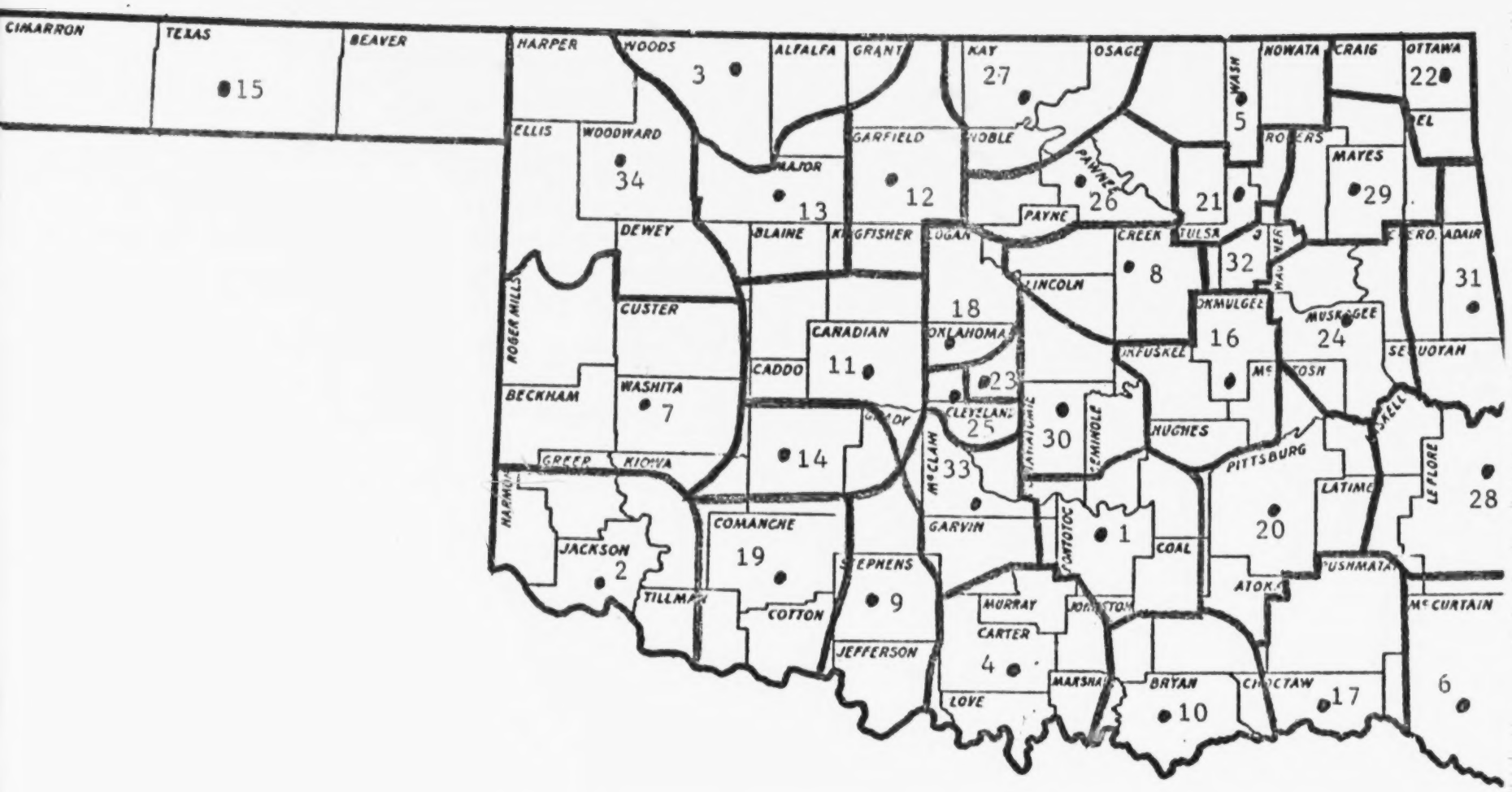

Figure 2. Area Vocational-Technical Training Center Locations and Boundaries.

diagram of the optimum locations composing the state-wide system of area vocational-technical training centers.

Table XLI consists of a list of the thirty-four area vocational-technical training centers, their valuation, total eleventh and twelfth grade enrollments, and the average student miles traveled to the area training center location. The thirty-four area vocational-technical training centers do not represent the recommended area vocational-technical training districts.

Consideration has been given to the districts already approved by the State Department of Vocational Education; the area center locations that do not or barely meet the minimum valuation requirements; and to the Tulsa and Oklahoma City independent school districts, which contain more than one area vocational-technical training center. This information provides the basis for proposing twenty-six area vocational-technical training districts. These districts and the location of the area vocational-technical training centers within each respective district for the State of Oklahoma are shown in Figure 3.

TABLE XLI

OPTIMUM LOCATION OF AREA VOCATIONAL-TECHNICAL TRAINING CENTERS FOR THE STATE OF OKLAHOMA

	Location	Valuation	Students in 11th & 12th Grades	Average Student Miles
1.	Ada	$ 52,427,552	1,726	16.8615
2.	Altus	67,815,861	1,601	17.5103
3.	Alva	50,460,099	581	15.6368
4.	Ardmore	61,777,315	2,156	16.0756
5.	Bartlesville	87,398,599	2,425	8.8746
6.	Broken Bow*	13,275,406	890	14.2269
7.	Burns Flat	89,320,082	1,986	25.9566
8.	Drumright	45,560,834	1,581	17.9462
9.	Duncan	53,015,667	1,738	10.2767
10.	Durant	40,000,000	1,341	15.5727
11.	El Reno	88,397,497	1,644	17.8229
12.	Enid	124,865,237	2,246	6.9447
13.	Fairview	40,305,274	647	19.1468
14.	Fort Cobb	43,994,488	1,434	20.6938
15.	Guymon	57,363,549	739	17.2584
16.	Henryetta	46,712,742	1,802	14.7635
17.	Hugo*	12,861,513	728	11.8296
18.	John Marshall (Okla. City)	339,408,525	7,494	7.2680
19.	Lawton	76,481,351	2,723	6.1289
20.	McAlester*	36,770,230	1,798	16.0172
21.	McLain (Tulsa)	231,416,353	4,732	6.0775
22.	Miami	42,881,870	1,454	12.6435
23.	Midwest City	102,948,536	3,772	2.5755
24.	Muskogee	80,064,558	3,046	12.1687
25.	Oklahoma City Vo. Tech.	287,117,731	6,858	6.3288
26.	Pawnee	53,058,978	1,445	23.6795
27.	Ponca City	95,192,403	2,050	21.0007
28.	Poteau*	25,684,369	1,462	20.4699
29.	Pryor	43,887,167	1,789	15.9508
30.	Shawnee	48,974,195	2,453	13.6379
31.	Stilwell*	17,415,138	1,728	24.0572
32.	Tulsa Vo. Tech.	460,112,700	9,023	6.5381
33.	Wayne	53,037,428	1,662	18.3814
34.	Woodward	75,272,197	1,023	19.4349

*Proposed as satellite centers

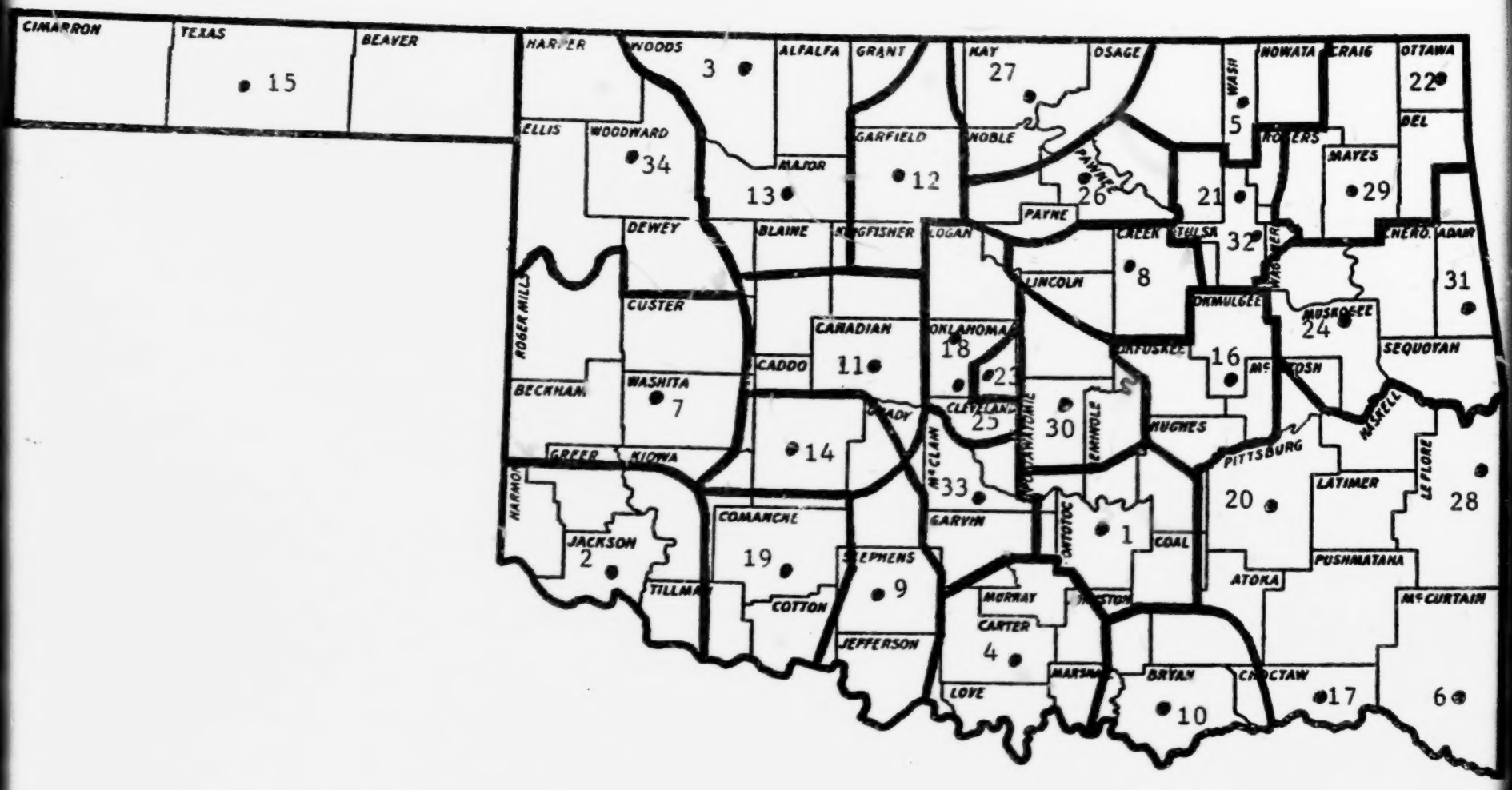

Figure 3. Area Vocational-Technical Training Center District Boundaries.

CHAPTER IV

Summary and Conclusion

This chapter consists of (1) a summary, which identifies the problems and describes how the objectives were fulfilled; (2) conclusion based on the research obtained; and (3) a discussion of areas for further research suggested in the course of this study.

Summary

The purpose of this study, as stated in Chapter I, was to determine the optimum location of area vocational-technical training centers to form a state-wide system of training centers for the State of Oklahoma. Information presented by the State Director of Vocational-Technical Education for Oklahoma and his supervisory staff for area vocational-technical training centers was instrumental in developing the criteria utilized by the programming technique. In addition the State Department of Education, the Statistical Department, the Finance Department, and the Oklahoma Tax Commission were very helpful in supplying needed information.

The information utilized for programming the alternative locations of area vocational-technical training centers is discussed in Chapter II. The results obtained from programming the alternative locations are presented in Chapter III.

The objectives of this thesis were (1) to develop a linear programming model for state-wide planning of area vocational-technical training centers; (2) to determine the district boundaries for future area vocational-technical training centers; (3) to establish boundaries for existing area vocational-technical training centers; (4) to make available to every student and adult an area vocational-technical training center; and (5) to determine the minimum number of area vocational-technical training centers to adequately serve the State of Oklahoma.

The State of Oklahoma was divided into sections to facilitate programming. Restrictions were imposed on the formation of a vocational-technical training district. These restrictions were as follows: (1) a maximum of 10,000 students for a given area training center; (2) a minimum set at zero for the number of students attending a center; (3) a minimum evaluation of $40,000,000 for a training district; and (4) a proximity of a 35-mile radius, except in the case of isolated independent districts. These restrictions are discussed in Chapters II and III.

A total of thirty-four area vocational-technical training centers are recommended for the State of Oklahoma. These centers are listed in Table XLI with their respective valuations, the total eleventh and twelfth grade enrollments in the proposed centers, and the average one-way miles traveled per student. A more detailed breakdown of data regarding the independent school districts that compose these centers is presented in individual tables in Chapter III.

From the thirty-four area vocational-technical training center locations, twenty-six area vocational-technical training districts were proposed and are outlined in Figure 3 in Chapter III.

Conclusions

The state-wide system of area vocational-technical training centers can be used effectively by persons or agencies planning area vocational-technical training centers. The procedure for locating training centers in this thesis can be applied to the optimum location of any service organization.

The linear programming model was allowed to choose the locations that would minimize the average miles traveled per student. This allows alternatives to be considered and decisions made from the results obtained while complying with the restrictions imposed.

Attention should be directed to the fact that this study was based upon programming around the existing area vocational-technical training centers. The optimum location of area vocational-technical training centers might have been different than this study reveals if this condition had not existed. However, the investment already existing in the established centers necessitated their being protected. The use of this study should prevent inaccessible pockets and help independent school districts, not a part of a vocational-technical training district, attach to an existing district.

Planners of area vocational-technical training centers should give serious study to (1) where a district should be formed and (2) where an independent school district may join an existing district. The establishment of these training centers should be viewed from a long-range

outlook, rather than from an immediate, short run, and isolated outlook. This would allow formation of centers which would eliminate the problem of independent school districts from being unable to adjoin an existing area vocational-technical training center; and would, at the same time, decrease the number of area training centers necessary to adequately serve the population of the state.

Need for Further Study

This study was based on the information persons involved in planning area vocational-technical training centers assumed to be necessary. There are many areas that need to be examined in order to form a more sound basis for these assumptions.

An area vocational-technical training center can be optimum from many points of view. This study dealt with optimally locating a center by minimizing the miles traveled per student within the boundaries of the previously listed restrictions. If a center is to be truly optimum it is necessary to include many more factors in order for this to be accomplished. The following areas are considered as major areas of research and could have been incorporated into the linear programming model if they had been available.

Before planning these optimum locations it would have been very useful to have known the optimum size of an area vocational-technical training center from both an economic and social standpoint. A study is recommended to determine the optimum size of an area vocational-technical training center.

Adult education is becoming a very important aspect in the field of vocational education. The adult enrollment already exceeds the

secondary school enrollment in Oklahoma area vocational-technical training centers. Some method needs to be determined to provide for the inclusion of adults in the population of persons to receive training. This area merits further examination and needs to be incorporated into guidelines for the establishment of training centers.

A study needs to be conducted to determine an equitable financing arrangement between the local, state, and federal agencies involved. This study should possibly go a step further and investigate the possibility of industries sharing in financing training centers.

There are many areas within the internal structure of area vocational-technical training centers that need investigation. The physical plant itself should provide flexibility for different training programs to be offered. Study needs to be directed toward equipping area vocational-technical training centers. All phases of securing equipment need to be investigated in order to be able to change vocational training offerings within a training center. A particular effort should be made to check leasing of equipment versus buying of equipment. If leasing of equipment could be accomplished, it may be possible to decrease the fixed costs and allow for a more rapid change of programs whenever graduates from particular programs have ceased to find employment.

Costs and benefits of vocational course offerings is another area where little information is available. If this kind of information were available it would assist administrators of area vocational-technical training centers in the setting of priorities for programs.

Another area closely associated with this is cost effectiveness of vocational education. Little information is available pertaining to this subject.

There are many areas in vocational education that merit research investigation. Area vocational-technical training centers are relatively new approaches to providing vocational training to secondary students and adults. These centers may eventually serve as agencies offering vocational educational training to secondary students, post-secondary students, and adults. Much research needs to be directed toward the area vocational-technical training centers to improve the vocational training offered and the quality of education persons attending these centers receive.

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